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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,125	07/02/2003	Andrew Weeks Kueny	946959-600013	3892

7590 10/05/2005

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EXAMINER	
MISLEH, JUSTIN P	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/612,125	KUENY, ANDREW WEEKS	
	Examiner	Art Unit	
	Justin P. Misleh	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 O.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 – 4, 14 – 16, 23 – 29, and 33 – 50* is/are rejected.

7)☒ Claim(s) *5 – 13, 17 – 22, and 30 – 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/2/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (see pages 3 and 4). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Claim Objections

2. **Claim 28** is objected to because of the following informalities: lack of clarity and precision.

3. **Claim 28**, the claim language relies on several items as being previously introduced (e.g. "the N linear pixel arrays" and "the N registers"), but no previous introduction has given for those respective items. **Appropriate correction is required.**

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1 – 4, 14 – 16, 23 – 29, and 33 – 50** are rejected under 35 U.S.C. 102(b) as being anticipated by West.

6. For **Claim 1**, West discloses, as shown in figures 4 and 5 and as stated in column 4 (lines 29 – 67), column 5 (lines 1 – 3, 10 – 27, and 56 – 62), and column 6 (lines 11 – 13), a method for enhancing dynamic range of data read from an imaging sensor [see below for Examiner's interpretation of this portion of the preamble], said imaging sensor (CCD 300) comprising N linear pixel arrays (column 4, lines 3 and 4, indicates a 1340 M rows x 400 N columns CCD 300), each of the N linear arrays (400 N Columns) having M charge coupled pixels (1340 M Rows), each pixel charge coupled, and further being coupled to one of N registers (Horizontal Charge Transfer Register 304), the method comprising:

integrating charge in at least some pixels of the N linear pixel arrays (In at least sections 401, 402, 403, and 404; see figure 4 and column 4, lines 47 – 59);

combining charge from a first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor in the N registers by shifting charge from the first region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67);

representing charge from at least a portion of the first region of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N first region data signals (As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.);

combining charge from a second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays in the N registers by shifting charge from said at least one pixel line of the second region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67); and

representing charge from at least a portion of the second region of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N second region data signals (As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.).

The CCD spectroscopy of West, as stated in column 3 (lines 10 – 18 and 30 – 43), provides kinetic spectroscopy wherein a single spectrum occupies multiple rows of elements that are binned to increase sensitivity and also provides multiline spectroscopy wherein plural spectra are captured in a large region and binned into a smaller region.

7. As for **Claim 2**, West discloses, as stated in column 5 (lines 34 – 40), presenting said portion of N first region data signals; and presenting said portion of N second region data signals (West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302. Spectroscopy includes displaying/presenting the captured spectra.).

8. As for **Claim 3**, West discloses wherein said first portion comprises N first region data signals (4 or 8 rows) and said second portion comprises N second region data signals (also 4 or 8 rows).

West states, since both the light and dark alternating area are eight rows high, the resulting arrangement is two rows of a spectrum comprising four binned rows of spectra and tow rows comprising dark charge.

9. As for **Claim 4**, West discloses, as stated in columns 4 (lines 47 – 67) and 5 (lines 1 – 4), defining the first region of the N linear pixel arrays of the imaging sensor (300) by designating at least one pixel line (4 or 8 lines) as belonging to the first region (401) of the N linear pixel arrays.

10. As for **Claim 14**, West discloses two modes for spectroscopy including kinetic and multiline. West discloses, as stated in column 5 (line 64) – column 6 (line 13), programming the

device with the appropriate readout mode, which alters an amount of pixel lines in a region prior to instructing said readout controller (also see column 4, line 47 – column 5, line 4). Hence, West discloses wherein defining the first region (401) of the N linear pixel arrays of the imaging sensor is accomplished during a setup phase of a device incorporating said imaging sensor.

11. As for **Claim 15**, West discloses two modes for spectroscopy including kinetic and multiline. West discloses, as stated in column 5 (line 64) – column 6 (line 13), programming the device with the appropriate readout mode, which alters an amount of pixel lines in a region prior to instructing said readout controller (also see column 4, line 47 – column 5, line 4). Furthermore, West discloses, in column 4 (line 47) – column 5 (line 4) and in column 5, lines 27 – 40), a four to one binning ratio can be used to compress 320 rows in region 301 into 80 rows in region 302 by an arrangement which bins according to the following algorithm: 5 to 1, 5 to 1, 4 to 1, 4 to 1, 2 to 1, 5 to 1, 5 to 1, 4 to 1, 4 to 1, 2 to 1, repeat, etc. Hence, West discloses wherein defining the first region of the N linear pixel arrays of the imaging sensor is accomplished dynamically, following said integrating charge in at least some pixels of the N linear pixel arrays, and prior to a subsequent integration of charge in at least some pixels of the N linear pixel arrays.

12. As for **Claim 16**, West discloses two modes for spectroscopy including kinetic and multiline. West discloses, as stated in column 5 (line 64) – column 6 (line 13), programming the device with the appropriate readout mode, which alters an amount of pixel lines in a region prior to instructing said readout controller (also see column 4, line 47 – column 5, line 4). Furthermore, West discloses, in column 4 (line 47) – column 5 (line 4) and in column 5, lines 27 – 40), a four to one binning ratio can be used to compress 320 rows in region 301 into 80 rows in

region 302 by an arrangement which bins according to the following algorithm: 5 to 1, 5 to 1, 4 to 1, 4 to 1, 2 to 1, 5 to 1, 5 to 1, 4 to 1, 4 to 1, 2 to 1, repeat, etc. Hence, West discloses wherein defining the first region of the N linear pixel arrays of the imaging sensor is accomplished dynamically, following said integrating charge in at least some pixels of the N linear pixel arrays, and prior to a subsequent integration of charge in at least some pixels of the N linear pixel arrays. Hence, the Examiner considers any region with four rows to be binned as small-amplitude signals and any region with eight rows to be binned as large-amplitude signals.

13. As for **Claim 23**, the CCD spectroscopy of West, as stated in column 3 (lines 10 – 18 and 30 – 43), provides kinetic spectroscopy wherein a single spectrum occupies multiple rows of elements that are binned to increase sensitivity and also provides multiline spectroscopy wherein plural spectra are captured in a large region and binned into a smaller region. Therefore, while not specifically shown or states, it must be that wherein a corresponding each of said portion of N first region data signals and each of said portion of N second region data signals both correspond to at least one discrete wavelength.

14. As for **Claim 24**, West discloses, as shown in figures 4 and 5 and as stated in column 4 (line 47) – column 5 (line 3) and column 5 (lines 27 – 40), combining (in CCD region 302; see figure 5) a part of said portion of N first region data signals (401) with a non-corresponding part of said portion of N second region data signals (402); and presenting the part of said portion of N first region data signals and the non-corresponding part of said portion of N second region data signals as a plurality of data signals.

West discloses multiline spectroscopy is provided with a plurality of different spectra. West also discloses kinetic spectroscopy is provided with a single spectrum.

15. For **Claim 25**, West discloses, as shown in figures 4 and 5 and as stated in column 4 (lines 29 – 67), column 5 (lines 1 – 3, 10 – 27, and 56 – 62), and column 6 (lines 11 – 13), an imaging apparatus (300) comprising an imaging sensor (300) comprising:

N linear pixel arrays (column 4, lines 3 and 4, indicates a 1340 M rows x 400 N columns CCD 300), each of the N linear arrays (400 N Columns) having M charge coupled pixels (1340 M Rows);

M pixel lines (1340), said M pixel lines being oriented in generally orthogonal direction to the N linear pixel arrays;

N registers (304), wherein one pixel in each of the N linear pixel arrays being charge coupled to a respective one of the N registers;

signal converter (amplifier in figures 4 and 5 that corresponds to amplifier 104 in figure 1);

an output node coupled to said signal converter (see output line extending from said signal converter);

a memory connected to said output node (although not specifically shown; a must have feature of the CCD image sensor 300);

a readout controller coupled to said imaging sensor for controlling readout of said M charge coupled pixels in all the N linear pixel arrays (although not specifically shown; a must have feature of the CCD image sensor 300); and

means for instructing said readout controller (see column 6, lines 11 – 13) for combining charge from a first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor in the N registers by shifting

charge from the first region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays; shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67); combining charge from a second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays in the N registers by shifting charge from said at least one pixel line of the second region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays; shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67).

The CCD spectroscopy of West, as stated in column 3 (lines 10 – 18 and 30 – 43), provides kinetic spectroscopy wherein a single spectrum occupies multiple rows of elements that are binned to increase sensitivity and also provides multiline spectroscopy wherein plural spectra are captured in a large region and binned into a smaller region.

16. As for **Claim 26**, West discloses wherein said memory being coupled to a display device (although not specifically shown; a must have feature of the spectroscopy system of West)

17. As for **Claim 27**, West discloses two modes for spectroscopy including kinetic and multiline. West discloses, as stated in column 5 (line 64) – column 6 (line 13), programming the device with the appropriate readout mode, which alters an amount of pixel lines in a region prior to instructing said readout controller (also see column 4, line 47 – column 5, line 4).

18. For **Claim 28**, West discloses, as shown in figures 4 and 5 and as stated in column 4 (lines 29 – 67), column 5 (lines 1 – 3, 10 – 27, and 56 – 62), and column 6 (lines 11 – 13), a computer program product, comprising a computer-readable medium (see column 6, lines 11 – 13) having stored thereon computer executable instructions for implementing a method for enhancing dynamic range of data read from an imaging sensor [see below for Examiner's interpretation of this portion of the preamble], said imaging sensor (CCD 300) comprising N linear pixel arrays (column 4, lines 3 and 4, indicates a 1340 M rows x 400 N columns CCD 300), each of the N linear arrays (400 N Columns) having M charge coupled pixels (1340 M Rows), each pixel charge coupled, and further being coupled to one of N registers (Horizontal Charge Transfer Register 304), said computer executable instructions comprising:

integrating charge in at least some pixels of the N linear pixel arrays (In at least sections 401, 402, 403, and 404; see figure 4 and column 4, lines 47 – 59);

combining charge from a first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor in the N registers by shifting charge from the first region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one

pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67);

representing charge from at least a portion of the first region of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N first region data signals (As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.);

combining charge from a second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays in the N registers by shifting charge from said at least one pixel line of the second region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67); and

representing charge from at least a portion of the second region of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N second region data signals

(As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.).

The CCD spectroscopy of West, as stated in column 3 (lines 10 – 18 and 30 – 43), provides kinetic spectroscopy wherein a single spectrum occupies multiple rows of elements that are binned to increase sensitivity and also provides multiline spectroscopy wherein plural spectra are captured in a large region and binned into a smaller region.

19. As for **Claim 29**, West discloses, as stated in columns 4 (lines 47 – 67) and 5 (lines 1 – 4), defining the first region of the N linear pixel arrays of the imaging sensor (300) by designating at least one pixel line (4 or 8 lines) as belonging to the first region (401) of the N linear pixel arrays.

20. For **Claim 33**, West discloses, as shown in figures 4 and 5 and as stated in column 4 (lines 29 – 67), column 5 (lines 1 – 3, 10 – 27, and 56 – 62), and column 6 (lines 11 – 13), a method for reading data from an imaging sensor (300), said imaging sensor (CCD 300) comprising N linear pixel arrays (column 4, lines 3 and 4, indicates a 1340 M rows x 400 N columns CCD 300), each of the N linear arrays (400 N Columns) having M charge coupled pixels (1340 M Rows), each pixel charge coupled, and further being coupled to one of N registers (Horizontal Charge Transfer Register 304), the method comprising:

defining a first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor, said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and

column 5, lines 1 – 3) and said at least one pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays;

defining a second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor, said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays;

defining a dark region (at least region 405a containing 8 rows) of the N linear pixel arrays of the imaging sensor, said dark region having a plurality of pixel lines (8 rows; see column 4, lines 47 – 57), said plurality of pixel lines are oriented in generally orthogonal direction to the N linear pixel arrays and said plurality of pixel lines are not exposed to light (see column 4, lines 31 – 34);

receiving a first image (multiline spectroscopy mode) on at least some of the pixels of the first region (401) of the N linear pixel arrays (see column 5, lines 10 – 40);

receiving a second image (multiline spectroscopy mode) on at least some of the pixels of the second region (402) of N linear pixel arrays (again see column 5, lines 10 – 40);

integrating charge in at least some pixels of the first region (401) of the N linear pixel arrays and in the at least some pixels of the second region (402) of the N linear pixel arrays (in at least sections 401, 402, 403, and 404; see figure 4 and column 4, lines 47 – 59);

reading out charge from said dark region (405a – 405d), said charge from said dark region having been shifted from each region (401 and 402) defined on the N linear pixel arrays of the imaging sensor (300; see column 5, lines 10 – 40).

The CCD spectroscopy of West, as stated in column 3 (lines 10 – 18 and 30 – 43), provides kinetic spectroscopy wherein a single spectrum occupies multiple rows of elements that are binned to increase sensitivity and also provides multiline spectroscopy wherein plural spectra are captured in a large region and binned into a smaller region.

21. As for **Claim 34**, West discloses combining charge integrated in a region (301) in a region of the N linear pixel arrays of the imaging sensors (300) in the N registers by shifting charge from the dark region (405a – 405d) along each of the N linear pixel arrays in the N registers; shifting charge from the N registers along a linear path; and representing charge from at least a portion of the region (301) of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N data signals associated with the region (As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.).

22. As for **Claim 35**, West discloses, as stated in column 5 (lines 10 – 27 and 63 – 67) and column 6 (lines 1 – 6), shifting charge from the dark region (405a – 405d) of the N linear pixel arrays of the imaging sensor (300) in the N registers; and discarding the charge shifted from the dark region of the N linear pixel arrays of the imaging sensor.

23. As for **Claim 36**, West discloses, as shown in figure 4, wherein the first region is further defined as a third region (403) and a fourth region (404) of the N linear pixel arrays of the imaging sensor.

24. As for **Claim 37**, West discloses, as stated in column 5 (lines 34 – 40), presenting said portion of N first region data signals; and presenting said portion of N second region data signals

(West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302. Spectroscopy includes displaying/presenting the captured spectra.).

25. As for **Claim 38**, West discloses, as stated in column 5 (lines 34 – 40), presenting said portion of N third region data signals; and presenting said portion of N fourth region data signals (West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302. Spectroscopy includes displaying/presenting the captured spectra.).

26. As for **Claim 39**, West discloses, as stated in column 5 (lines 10 – 40), wherein a sum (binning) of the pixel lines defined in said first region (401), said second region (402) and said dark region (405a – 405d) comprises at least M pixel lines.

27. As for **Claim 40**, West discloses, as stated in column 5 (lines 20 – 40), wherein said plurality of pixel lines of the dark region (405a – 405d) of the N linear pixel arrays is defined as at least M/2 pixel lines (see "binning ratio").

28. For **Claim 41**, West discloses, as shown in figures 4 and 5 and as stated in column 4 (lines 29 – 67), column 5 (lines 1 – 3, 10 – 27, and 56 – 62), and column 6 (lines 11 – 13), a method for enhancing dynamic range of data read from an imaging sensor [see below for Examiner's interpretation of this portion of the preamble], said imaging sensor (CCD 300) comprising N linear pixel arrays (column 4, lines 3 and 4, indicates a 1340 M rows x 400 N columns CCD 300), each of the N linear arrays (400 N Columns) having M charge coupled

pixels (1340 M Rows), each pixel charge coupled, and further being coupled to one of N registers (Horizontal Charge Transfer Register 304), the method comprising:

integrating charge in at least some pixels of a first region (401) of the N linear pixel arrays (In at least sections 401, 402, 403, and 404; see figure 4 and column 4, lines 47 – 59) and at least some pixels of a second region (402) of the N linear pixel arrays, said first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor, said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays; and said second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor, said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays;

combining charge from a first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor in the N registers by shifting charge from the first region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the at least some pixels of the first (401) and second regions (402) of the N linear pixel arrays along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67) into a dark region (at least region 405a containing 8 rows) of the N linear pixel arrays of the imaging sensor, said dark region having a plurality of pixel lines (8 rows; see column 4, lines 47 – 57), said plurality of pixel lines are oriented in generally orthogonal direction to the N linear pixel arrays and said plurality of pixel lines are not exposed to light (see column 4, lines 31 – 34);

representing charge from at least a portion of the first region of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N first region data signals (As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.);

combining charge from a second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays in the N registers by shifting charge from said at least one pixel line of the second region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67);

representing charge from at least a portion of the second region of the N linear pixel arrays, shifted out of the N registers, as a corresponding portion of N second region data signals (As stated in column 5, lines 34 – 40, West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302.);

and clearing charge from the dark region of the N linear pixel arrays of the imaging sensor (column 6, lines 1 – 6).

The CCD spectroscopy of West, as stated in column 3 (lines 10 – 18 and 30 – 43), provides kinetic spectroscopy wherein a single spectrum occupies multiple rows of elements that are binned to increase sensitivity and also provides multiline spectroscopy wherein plural spectra are captured in a large region and binned into a smaller region.

29. As for **Claim 42**, West discloses, as stated in column 5 (lines 34 – 40), presenting said portion of N first region data signals; and presenting said portion of N second region data signals (West states kinetic spectroscopy may be accomplished by capturing a single spectrum comprising multiple rows in region 302, binning such multiple row spectrum into one or more rows in region 301, and then capturing a subsequent spectrum in region 302. Spectroscopy includes displaying/presenting the captured spectra.).

30. As for **Claim 43**, West discloses wherein said first portion comprises N first region data signals (4 or 8 rows) and said second portion comprises N second region data signals (also 4 or 8 rows).

31. West states, since both the light and dark alternating area are eight rows high, the resulting arrangement is two rows of a spectrum comprising four binned rows of spectra and tow rows comprising dark charge.

32. As for **Claim 44**, West discloses integrating charge in at least some pixels of a first region (401) of the N linear pixel arrays (In at least sections 401, 402, 403, and 404; see figure 4 and column 4, lines 47 – 59) and at least some pixels of a second region (402) of the N linear pixel arrays, said first region (at least region 401 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor, said first region (401) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one pixel line of the first region is oriented in generally orthogonal direction to the N linear pixel arrays; and said second region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays of the imaging sensor, said second region (403) having at least one pixel line, and said at least one pixel line of the second region is oriented in generally orthogonal direction to the N linear pixel arrays.

33. As for **Claim 45**, West discloses, as stated in column 6 (lines 1 – 6), wherein clearing charge from the dark region of the N linear pixel arrays further comprises: shifting charge from the dark region of the N linear pixel arrays of the imaging sensor in the N registers; and discarding the charge shifted from the dark region of the N linear pixel arrays of the imaging sensor.

34. As for **Claim 46**, West discloses, as stated in column 5 (lines 10 – 40), wherein a sum (binning) of the pixel lines defined in said first region (401), said second region (402) and said dark region (405a – 405d) comprises at least M pixel lines.

35. As for **Claim 47**, West discloses, as stated in column 5 (lines 20 – 40), wherein said plurality of pixel lines of the dark region (405a – 405d) of the N linear pixel arrays is defined as at least M/2 pixel lines (see "binning ratio").

36. As for **Claim 48**, West discloses multiline spectroscopy including a plurality of spectra. Furthermore, West discloses, in column 5 (lines 14 - 9) and column 5 (line 56) – column 6 (line 6), wherein said first region (401) of the N linear pixel arrays having a first image (first spectra) projected thereon; and said second region (402) of the N linear pixel arrays having a second image (second spectra) projected thereon.

37. As for **Claim 49**, West discloses multiline spectroscopy including a plurality of spectra. Furthermore, West discloses, in column 5 (lines 14 - 9) and column 5 (line 56) – column 6 (line 6), wherein said first region (401) of the N linear pixel arrays being exposed to a first light source (first spectra), and said second region (402) of the N linear pixel arrays being exposed to a second light source (second spectra)

38. As for **Claim 50**, West discloses integrating charge in at least some pixels of a one other region (403 – 404) of the N linear pixel arrays (In at least sections 401, 402, 403, and 404; see figure 4 and column 4, lines 47 – 59), said other region (403 – 404) of the N linear pixel arrays having at least one pixel line (8 rows; see column 4, lines 49 – 59, and column 5, lines 1 – 3) and said at least one pixel line of the other region is oriented in generally orthogonal direction to the N linear pixel arrays;

shifting charge from the at least some pixels of the other region (403 – 404) of the N linear pixel arrays along a linear path (Again, West teaches that the binned spectra rows are reads

out through horizontal register 304; see column 4, lines 66 and 67) into a dark region (at least region 405a containing 8 rows) of the N linear pixel arrays of the imaging sensor,

for each of the at least other region (403 or 404), combining charge in one of the at least one other region (at least region 402 containing 8 rows are binned in binning row 406; see figure 4) of the N linear pixel arrays in the N registers by shifting charge from said at least one pixel line of the dark region along each of the N linear pixel arrays to each of the N registers (The binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67), and

shifting charge from the N registers along a linear path (Again, West teaches that the binned spectra rows are reads out through horizontal register 304; see column 4, lines 66 and 67).

Allowable Subject Matter

39. **Claims 5 – 13, 17 – 22, and 30 – 32** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

40. The following is a statement of reasons for the indication of allowable subject matter:

As for **Claims 5 – 13 and 30 – 32**, while the closest prior art discloses multiline spectroscopy or kinetic spectroscopy utilizing a CCD image sensor and pixel line binning for binning a plurality of pixel lines from a plurality of different regions on the CCD image sensor to increase spectrum/spectra sensitivity;

The closest prior art does not teach or fairly suggest determining/adjusting an amount of pixel lines belonging to at least one of said plurality of different regions, wherein the amount the

pixel lines relates to the level of improvement in dynamic range or relates to the comparison of a target signal level.

As for **Claims 17 – 22**, while the closest prior art discloses two modes for spectroscopy including kinetic and multiline, programming the spectroscopy device with the appropriate readout mode, which alters an amount of pixel lines in a region prior to instructing said readout mode, wherein the readout mode alters the readout binning mode such that a four to one binning ratio can be used to compress a large number of rows in into a smaller number of rows, wherein the large number rows may be divided into separate regions of rows having corresponding large and small amplitude signals;

The closest prior art does not teach or fairly suggest re-scaling one of said small-amplitude signals from said first region and said large-amplitude signals from said second region or determining a relationship between said small-amplitude signals of said first channel from said first region, and said large-amplitude signals of said second channel from said second region.

Cited Prior Art

41. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure at least for the reasons that taken alone or in combination provide various apparatuses and corresponding methods of operating thereof for spectroscopy and/or pixel line binning both utilizing an imaging sensor.

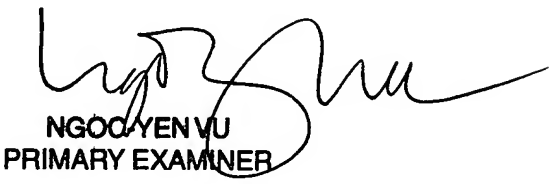
Conclusion

42. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 571.272.7313. The Examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Ngoc Yen Vu can be reached on 571.272.7320. The fax phone number for the organization where this application or proceeding is assigned is 571.273.3000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
October 3, 2005



NGOC YEN VU
PRIMARY EXAMINER

TO/SB/08A (10-01)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Complete if Known	
				Application Number	NEW
				Filing Date	
				First Named Investor	Andrew Weeks Kueny
				Art Unit	~~Unassigned~~ 2612
				Examiner Name	Unassigned
Sheet	1	of	1	Attorney Docket Number	946959-600013

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document Number – Number – Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A	US-5,675,411	Oct. 7, 1997	Brooks et al.	
	B	US-6,175,383 B1	Jan. 16, 2001	Yadid-Pecht et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document – Country Code[3] – Number[4] – Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	9/20/05

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Applicant's unique citation designation number (optional).
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PTO/SB/08B (10-01)

Substitute for form 1449B/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	NEW
				Filing Date	
				First Named Investor	Andrew Weeks Kueny
				Art Unit	~~Unassigned~~ 2612
				Examiner Name	Unassigned
Sheet	1	of	1	Attorney Docket Number	946959-600013

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
AK		Technical Manual, "An Introduction to Scientific Imaging Charge-Coupled Devices," Scientific Imaging Technologies, Inc., Beaverton, OR, 1994.	

Examiner Signature		Date Considered	9/20/05

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Applicant's unique citation designation number (optional).
[2] Applicant is to place a check mark here if English language Translation is attached.

Notice of References Cited	Application/Control No. 10/612,125	Applicant(s)/Patent Under Reexamination KUENY, ANDREW WEEKS	
	Examiner Justin P. Misleh	Art Unit 2612	Page 1 of 1

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	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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